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In Mammalia the subject of inquiry has been chiefly the following, viz. to ascertain how far there was evidence that the secretion of bile actually is effected in and by the hepatic cell, or whether its presence in them is accidental, and the bile is really and necessarily secreted by the ultimate ducts.

It is remarked that the existence of a portal vein conveying blood from the intestinal surface is coeval, not with the formation of a bile-secreting structure (for many animals have organs which secrete abundance of biliary matter without any portal vein), but with the addition of a parenchymatous mass to the biliary organ, to which mass exclusively the portal vein is distributed. It is known that the parenchyma of the liver during, and for many hours after, digestion of food, forms, from the blood supplied to it, abundance of sugar, which thus appears to be its proper secretion; and it is not proved that the hepatic cells in a healthy state contain biliary matter, though they often do in various morbid conditions. Extracts of the hepatic parenchyma tested for bile by Pettenkoffer's method, give only very imperfect and doubtful traces of the presence of biliary matter, and on the other hand the sugar formed by the parenchyma, which is found so abundantly in the blood of the hepatic vein, is absent from the bile. The case of fatty liver, as occurring either pathologically or normally, seems also to require an explanation consonant with the view to which the above facts point, for otherwise it seems impossible to understand how perfectly formed dark-green bile could be contained in the efferent channels of a gland whose tissue is a mass of oil.

The structural condition of the ultimate biliary ducts is compared to that of the epithelium of the thyroïdal cavities, and the nucleated granular tissue surrounding the lacteal in a villus; and it is shown to be probable that the terminal portions of the ducts,—so far as they possess the peculiar characteristic structure, exert an active elaborating energy, by means of which bile is formed or generated out of oily, albuminous or saccharine material which surrounds,—may be said to bathe them.

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February 5, 1852.

SIR JOHN F. W. HERSCHEL, Bart., V.P. in the Chair.

The following papers were read:—

1, "Discovery that the veins of the Bat's wing, which are furnished with valves, are endowed with rythmical contractility, and that the onward flow of blood is accelerated at each contraction." By T. Wharton Jones, F.R.S., Fullerian Professor of Physiology in the Royal Institution of Great Britain, &c. Received November 20, 1851.

The author finds that the veins of the bat's wing contract and dilate rythmically, and that they are provided with valves; some of which completely oppose regurgitation of blood, others only par-

tially. The act of contraction of the vein is manifested by progressive constriction of its calibre and increasing thickness of its wall; the relaxation of the vessel, by a return to the former width of calibre and thickness of wall. The rythmical contractions and dilatations of the veins are continually going on, and that, on an average, at the rate of ten contractions in the minute. The contractions *centrad* and *distad* of a valve appear to be simultaneous, as also the dilatations.

During contraction, the flow of blood in the vein is accelerated, and on the cessation of the contraction, the flow is checked, with a tendency to regurgitation, which brings the valves into play. But this check to the onward flow of the blood is usually only momentary; already, even while the vein is in the act of again becoming dilated, the onward flow recommences and goes on, though with comparative slowness, until the vein contracts again. It is the heart's action which maintains the onward flow of blood during the dilatation of the vein, whilst it is the contraction of the vein, coming in aid of the heart's action, which causes the acceleration.

The valves are composed sometimes of but a single flap, sometimes of two. In the situation of a valve and *centrad* of the insertion of its flaps, the veins present the usual dilatations or sinuses. The valves are a reduplication of the clear innermost coat of the vein, with sometimes an intervening layer of cellular tissue.

The veins closely accompany the arteries, the nerve only intervening.

The contractility of the arteries the author finds altogether different from that of the veins, being *tonic*, not *rythmical*. He has not been able to observe unequivocal evidences of *tonic* contractility of the veins, which they have been alleged to possess.

In figure 3, of drawing No. 1, illustrating his paper, the author represents, in reference to this point, an artery and a vein, as observed immediately after pressure had been applied over them. The artery is seen constricted at intervals both above and below the place of pressure. The vein is not so constricted, but at the place where the pressure was applied there is seen a greyish granular deposit of lymph within the vessel, giving rise to an appearance of constriction by narrowing the stream of blood. On watching a vein in this state, the author has observed portions of the lymph deposit carried away by the stream of blood, with corresponding enlargement of the channel.

The author further finds that nowhere do the arteries and veins of the web of the bat's wing directly communicate, as has also been alleged; the only communication being the usual one through the medium of capillaries.

In an appendix to this paper, the author describes the result of his microscopical examination of the structure of the veins and arteries. Both artery and vein have a middle coat of circularly disposed muscular fibres; but the appearance of the fibres is different in the two vessels. The fibres of the vein are  $\frac{1}{3600}$  dth in. broad, pale, grayish, semitransparent and granular looking. In general aspect,

they very much resemble the muscular fibres of the lymphatic hearts of the frog; but in none did the author detect an unequivocal appearance of transverse marking. The fibres of the middle coat of the artery are not so pale looking, are clearer, and exhibit a more strongly marked contour.

2. "Some Observations on the Ova of the Salmonidæ." By John Davy, M.D., F.R.S. Lond. and Ed., Inspector-General of Army Hospitals, &c. Received November 20, 1851.

The author prefaces his observations by a quotation from the work of M. Vogt on the Embryology of the Salmonidæ, in which a remarkable property of the vitellus is described, viz. its coagulation by admixture with water.

This inquirer's experiments were made chiefly on the ova of the *Palée* (*Coregonus Palæa*, Cuv.); the author's mostly on the ova of the Charr (*Salmo umbla*). After giving a description of the mature eggs of this fish, he details the trials instituted by him:—1st, on the action of water, showing its coagulating effect, except when added in very minute quantity. 2ndly, on the action of heat; how that a dry heat, even so high as that of 212° Fahr., occasions the contraction of the vitellus from evaporation, but not its coagulation, an effect even not produced by steam of the same temperature, but which is occasioned by boiling in water, owing, it is inferred, to an admixture of water. 3rdly, on the action of alkalies and salts; how these, such as potassa, ammonia and their sesquicarbonates in solution, nitre, acetate of lead, common salt and others, when of moderate strength, not only do not coagulate the vitellus, but have the property of dissolving a certain portion of coagulum, and coagulate it only when very much diluted. 4thly, on the action of acids and some other agents; how the vegetable acids tried, as the tartaric, oxalic, acetic, whether strong or dilute, do not coagulate the vitelline fluid, but dissolve its coagulum; how the strong sulphuric and muriatic acids inspissate it, the weak coagulating it; and further, how it is coagulated by the nitric acid, by corrosive sublimate and by alcohol, but not by iodine.

The inference from the experiments drawn by the author is, that the vitellus of the Charr and of the eggs of the other Salmonidæ is distinct in its properties, both from the albumen and yolk of the eggs of birds. He conjectures from analogy that the ova of other species of osseous fishes will be found to be similar; but not so those of the cartilaginous fishes. According to the observations he has made, the yolk of the eggs of fishes of this order, whether they possess a white, as in the instance of the oviparous; or are destitute of a white, as in that of the viviparous, resembles in its general character that of the egg of birds: but he doubts that the white of the former will be found analogous to that of the albumen ovi of birds, at least in its chemical qualities; having in one instance, that of the egg of the *Squalus Catulus*, found it to be, whilst transparent and viscid, neither coagulated by heat nor by nitric acid.

In conclusion, he suggests that the coagulation of the ova of the

PROCEEDINGS OF THE ROYAL SOCIETY. VOL. VI. No. 86. 11